

## OXYCODONE INGESTION PATTERNS IN ACUTE FRACTURE PAIN: A PILOT STUDY USING A DIGITAL PILL

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**Background:** Opioids are prescribed for acute pain as needed, but no data exists on how patients take opioids after discharge from the ED. This places the onus of dosing on the patient and contributes to variable prescribing by ED physicians. ED opioid prescriptions serve as a source for unintentional exposure and contribute to the opioid epidemic. We deployed a digital pill to measure opioid ingestion patterns in individuals discharged after acute fractures.

**Methods:** This pilot study involved individuals without chronic opioid use (i.e. prescribed opioids > 1 week) who were discharged from the ED following acute fracture. Participants were trained to use a digital pill system comprising a single pill (5 mg oxycodone tablet + radiofrequency emitter) and a hip mounted receiver. Upon contact with gastric contents, the digital pill transmitted a radio signal to the receiver, which relayed time of ingestion via cellular 3G signal in real-time to a cloud based server. Participants were instructed to take 1-2 oxycodone digital pills as needed every 8 hours for pain. Participants returned unused medication at orthopedic follow up or 1 week post discharge where any discrepancies between digital pill data and pill counts were reconciled.

**Results:** We enrolled 10 participants (mean age 42). 50% of fractures were managed operatively and 50% were managed nonoperatively. The system recorded ingestions with 85% accuracy. Participants ingested a mean 43 mg oxycodone during the 1 week study period with dose de-escalation occurring after 24 hours. Participants ingested a mean 75.8% of their 1 week total dose in the first 72 hours. 40% of participants stopped taking opioids by 96 hours. 40% of participants remained on opioids 1 week after injury; all required operative treatment.

**Conclusions:** This is the first study to determine opioid ingestion patterns in ED patients discharged with acute fracture pain. Participants self-tapered opioids after 24 hours, most ingestion occurred in the first 72 hours, and a substantial proportion (40%) stopped ingesting oxycodone by 96 hours. Our data shows individuals may require less opioid analgesics than previously considered for acute fracture pain. Additional studies should address ingestion patterns in other painful conditions and development of ED-based interventions to minimize outpatient opioid use while controlling pain.

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